Today's Research is Tomorrow's Care
By Kenneth H. Buetow, Ph.D.

Modern technology has made the world flat and the planet small, and has overcome traditional limitations of time and space. In consumer hands, technology has revolutionized our interactions with each other, and in how we share the large (and ever-smaller) events of our lives.

Now, technology is on the brink of accelerating research discoveries and making health care far "smarter" – and more individualized to our unique characteristics – by using the tools and technologies that are familiar in our daily lives to unravel the mystery of disease and assist our doctors.

Most people are surprised that the standards-based connectivity developed for our modern world – such as online banking – is NOT already in use in the medical world. Most physicians' offices still use paper records, and the electronic records that do exist often aren't easily accessible and don't connect with other necessary institutional systems, hampering discovery and development of new therapies.
It's clear that we need to bring the level of Internet connectivity seen by consumers in their office work, financial transactions and social lives to consumers of health care services. The need is particularly urgent in cancer, which is fast becoming the foremost disease killer of our time.

To that end, key parts of the cancer community are moving towards an interconnected information resource called the Cancer Knowledge Cloud. The Cancer Knowledge Cloud is simply a means of using the Internet to connect massive amounts of individual and organizational biomedical data, software applications with which to handle and analyze all those data, and the cheap computational horsepower to do the work.
The technical means to make this Cloud function is already available through caBIG® (cancer Biomedical Informatics Grid), the online information network of the National Cancer Institute (NCI) for the cancer community, which provides the standards, tools and privacy protections that are needed for cloud computing. caBIG® has a connectivity system (caGrid) that now connects the key players in cancer research, including research hospitals, Cancer Centers and other NCI-supported institutions.

Because the Cancer Knowledge Cloud isn't the way the biomedical community has traditionally worked, NCI is also pioneering a new model of collaboration across all the sectors in life sciences and health care, called the BIG Health Consortium. If such a digitally connected ecosystem can be achieved, we can envision a 21st century health enterprise that connects individuals, organizations and their information in a seamless and continuous cycle of discovery, faster diagnostic and pharmaceutical product development and improved clinical care.

Here's one hypothetical use of the Cloud: Information is made accessible through the cloud from those who have biological and clinical data from cancer patients, as well as vast quantities of generic and cancer-specific genetic information. As cloud-accessible content becomes richer, information can be joined and then applied to research and clinical care questions. Authorized researchers can analyze the outcomes from patients with comparable conditions who've been treated with different therapies (known as comparative effectiveness research) and then cross-compare them with the genomic profiles to see if some drugs are working better in certain genetic sub-groups (i.e., molecularly informed comparative effectiveness.) In time, analyses like these could become a real-time system for making today's research into tomorrow's care – all enabled by the Cancer Knowledge Cloud. Booth #3805

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